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Journal of the Society of Arts.

FRIDAY, JANUARY 4, 1861.

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EXAMINATIONS.—LOCAL BOARDS.

Those Secretaries of Institutions who have not forwarded Lists of their Local Educational Boards are requested to send them as soon as possible.

PRIZE FOR AN ESSAY ON MARINE ALGÆ.

The 31st December, 1860, being the last day for the reception of Essays in competition for the Prize of £100, placed at the disposal of the Council by Sir W. C. Trevelyan, Bart., the Secretary begs to announce that two Essays have been received, bearing the respective mottoes of "Humilitas" and "Spes."

INTERNATIONAL EXHIBITION OF 1862.

The Cape of Good Hope *Gazette* announces that his Excellency the Governor of that Colony is desirous that the products of the Cape of Good Hope should be properly exhibited at the ensuing International Exhibition, to be held in London in 1862, feeling convinced that great benefit will result from a knowledge of the natural resources of the Colony being extensively disseminated. His Excellency has therefore appointed the under-named gentlemen to form a Commission to deliberate upon the best means of carrying out this design, and trusts that they will meet with the support and co-operation of all classes of Her Majesty's subjects in South Africa:—The Hon. R. Southy, Acting Colonial Secretary; the Hon. W. Porter, Attorney-General; Hon. W. S. Field, Acting Collector of Customs; Sir Thomas Maclear, Astronomer Royal; L. Pape, Esq., M.D., Colonial Botanist; Sir W. Hodges, Knight; and Messrs. P. B. Borcherds, T. B. Bayley, E. Laidesberg, J. R. Marquard, C. Mumick, E. J. Jerram, S. van Reenen, R. H. Arderne, R. Hare (Groenefontein), J. C. Gie, and R. W. Murray; Committee of the Cape of Good Hope Agricultural Society—Messrs. F. W. Reitz (Swellendam), T. C. Bourhill (Caledon), J. C. Molteno (Beaufort), J. Rainier (Malmesbury), J. J. Proctor (Paarl), J. H. Memnick (Tulbagh), J. Brand (Clanwilliam), W. Walters (George), C. Manuel (Bredasdorp), R. Le Sueur (Worcester), delegates of the Western Districts named after each; and Messrs. T. Ansdell, J. Eustace, J. Sheppard, R. Clarence, and E. Macgibbon.

THE PRESERVATION OF FOOD.

By Rear-Admiral Sir Charles Elliot.

Judging from the public notices on the harvest, there seems little doubt that all kinds of winter support for cattle and sheep have fallen short. If that should prove to be the case, or whenever it be so, it is clear that effective means of making those stocks go farther, must be more advantageous in proportion to the intensity of the pressure.

My present object however, is not to consider the accuracy, partial or complete, of these reports, but to claim attention to the fact that meat may be preserved in carcase in this country, between the middle of November and the early part of May, as it is in Russia and in Canada, and, indeed, as it is here (without any artificial appliances) in seasons of protracted frost, for periods of considerable duration. It has, no doubt, happened to many of us to partake of a saddle of mutton in the depth of a hard winter, which had been hung up in a friend's larder for upwards of a month, not only without the least taint to the meat, but, on the contrary, to its great improvement.

There is, in fact, no difficulty in subjecting meat in carcase to the exact condition of temperature, and necessarily of dryness requisite for its perfect preservation; and, it may be confidently added, that efficiently-constructed and well-fitted depots for the storeage of meat between certain points of reduced temperature during the winter months would be far less chargeable, troublesome, and hazardous of management than conservatories of delicate tropical plants necessarily maintained at a high degree of heat and humidity through every hour of that season so formidably trying to such productions. I have eaten of a turbot at Barbadoes (taken on the coast of England more than three weeks before), with the thermometer at a tropical range for at least six previous days, in as fine condition as I ever tasted the fish in London. Mr. Alderman Mechi, to whom I mentioned this fact, remarked to me that it did not surprise him. He had eaten of salmon taken out of a river in Scotland on the same day, which he thought could not be compared in point of excellence with salmon taken out of an ice basket that had probably lain in London for several days, or it might be weeks.

Professor Hofmann, with whom I have conferred on this subject, observed to me that the point for consideration is not whether meat can be perfectly preserved in carcase for indefinite periods under certain conditions of reduced temperature, for that is indisputable, but whether it would be cheaper, and otherwise more advantageous, to keep the meat in carcase from the moment the animal is in a fit condition to be slaughtered, at the least outlay for food. He thought that it was very probable that may prove to be the case, and strongly encouraged me to pursue the subject.

If we suppose that a grazier, in a situation to send to market, one season with another, twenty head of cattle and 100 head of sheep in prime condition for the butcher, should be henceforth furnished with the means of storing that quantity in carcase in all the month of December, with the assured knowledge that the meat could be kept and moved to market in that state of good condition throughout the ensuing four months, it is plain that his capabilities to rear stock would be well-nigh doubled. But what is true of one farm in such circumstances is true of vast breadths of land appropriated to the growth of winter food for cattle under similar conditions of security of deposit and transport to market in prime condition. With our insignificant distances of navigation, and great and increasing facilities of rapid transport, by water and land, it is easy to secure any conditions of temperature requisite for the perfect preservation of the meat, in transit, not merely in winter, but in the hottest season of the year.

What the difference would be in years of average crops between the charge of maintaining the beasts alive and of storing their carcases under effective conditions of reduced temperature, for equal periods, would of course depend upon the economic soundness and practical skill of these last arrangements. At all events, I hazard nothing in saying that, even in years of most abundant crops there would be a large margin in favour of the storage system. It is manifest that it must in all cases cost much less to keep meat cold and fresh during the winter months, when the conditions of natural temperature are favourable to such objects, than to make and keep beasts fat in the same season, when cattle food must be most expensive, and it must need much more of it to nourish the animals than in the spring and summer months.

In point of principle, it is incontestable that cattle, sheep, and hogs should never be driven one foot farther than may be necessary to transport them to positions where they can be put into carcase, and conveyed more economically, by land or water, under proper securities for the preservation of the meat in prime condition.

Adverting to the great and increasing cattle trade between Ireland and Great Britain, it has occurred to me that the most eligible mode of accomplishing the purposes in view would be to establish great abattoirs, with properly-constructed and efficiently-cooled depots attached to them, at the principal ports of export, as well as establishments of the same kind at the opposite termini of the lines, and at stations along them contiguous to the great grazing districts of the country. But it would be obviously impossible to make such arrangements at every point of the lines at which cattle are received for transport. The best thing to be done, therefore, as it seems to me, would be to establish branch depots at judiciously-selected positions on the lines, such, for example, as the sites of great cattle fairs and markets, concentrating at these points effective means for slaughter, storeage, and transmission of the carcases from time to time to the depots of export, as well as for utilising all the other merchantable products of great abattoir establishments, and for restoring to the soil in the fittest condition, at the least loss of time, and least cost, all that portion of the results which serve as manure.

Reflecting on this subject as I passed through Ballinasloe a few weeks before the large annual fair, it struck me that it would be an excellent position for such an establishment as had suggested itself to my mind, of course in connexion with proper storeage and forwarding depots at the great ports of export. Assuming that the whole organisation had been carried out by the suitable equipment of air-tight tanks in the steam-ships for the safe conveyance of the meat, and in the waggons on the rail (to be maintained at a temperature rather below the freezing point), it would scarcely be too much to say that the economy effected of immense stocks of expensive cattle food and in reduced freight would probably not be less than the whole amount of money which the graziers had received for the beasts they had brought up to that fair.

The above remarks refer entirely to the cattle trade between Ireland and Great Britain, but if they are sound as respects that trade, it is clear that they are equally so of the storage and transport of meat by land or water in all countries possessing the necessary pervasive facilities of rapid land and water locomotion.

The time, I believe, is not distant when the great abattoir establishments of centres of large consumption, with all their mischief sanitarily considered, temptation to intemperance and vice, and waste of valuable resource, will be replaced by great central and district depots for the storeage of meat, fish, poultry, and all fruits, vegetables, and other alimentary products to which scientific and systematic modes of maintaining them at the necessary degree of reduced temperature can give prolonged subsistence without deterioration.

An important effect of the successful adoption of this system for the storeage and transport of meat would be to extend to it the solidity of other great staples of consumption as a basis of commercial and financial security. Sugar, for example in depot, is subject to much more of waste than would be the case with meat under the conditions here contemplated, but sugar finds its way to consumption under much steadier circumstancess both for buyer and seller, than meat under the present hand-to-mouth conditions of supplying and clearing the market according to all the variations of the temperature and fluctuations in the cost of cattle food. It frequently happens, I am told, and especially at the season of Christmas, Easter, Whitsuntide, and Michaelmas, that immense stocks of the finest descriptions of meat, poultry, game, &c., collected at the great centres of consumption, are suddenly thrown upon the market, and sacrificed at a heavy loss in consequence of a sudden change of temperature. But if effective depots existed for the safe keeping of these valuable supplies, that would not happen. Capitalists engaged in those branches of trade would purchase for storeage in all such cases of immediate over-supply, to the great relief of the holders (usually persons of small means) and of the public.

If we advert for a moment to the enormously high prices of cattle and sheep fodder in the winter and spring of the current year (and it may be added that the prospects of the present winter are not encouraging in these respects) we shall indeed be struck with the immense public advantage of an effective system for the storeage and transport of meat such as I have endeavoured to explain above. In some parts of the North of England and Scotland, where I chanced to be residing at that time, the pressure on the cattle was most distressing. Many farmers, I was credibly informed, were compelled in the lambing season to kill the lambs to save the mothers, owing to the almost total failure of the carrot crop; and a friend of my own, who farms with great success on a large scale in Westmoreland, at several miles distance from a railway, told me that, in the very tardy spring, it would literally be cheaper for him to feed his stock on wheaten bread than on hay at the price for which he could then purchase it. Some millions sterling would have been saved to the public wealth in the economy of cattle food, in the price of meat, and in the consequences on the general trade of the country of an unusually high price of provisions throughout the winter and spring, if large stocks of the cattle intended for slaughter in the ensuing four months could have been put into carcase in the month of December, 1859, under such conditions of safe storeage and transport to market as I am convinced are susceptible of steady establishment.

Most economic writers have noticed the great difference observable in the genius of invention and improvement in commercial and manufacturing processes, and in all the labours and operations which have the nourishment of man for their object. It cannot be denied, at least, that our present situation in all that concerns the preservation and transport of our animal food, is forcibly corroborative of that remark. In these respects we are still in a very backward, not to say a barbarous, state of civilisation. No man of observation can visit one of our great cattle markets in large cities, or attentively examine the condition of the beasts during the voyage from Ireland, or in closely-packed cars on long journeys, without being struck by the humiliating juxtaposition between great and growing advancement in the decencies and conveniences of life and revolting proofs of unnecessary violence, too often of savage cruelty, and always of deterioration of the meat, and superfluous expense, which are the results of our present modes of fulfilling this great requirement of our existence.

I do not enter into any detailed explanation of my own ideas of constructing and organising the service of the depôts, or on the fitting of the vehicles or tanks of transport, either by land or sea, so as to secure the necessary conditions of temperature and cleanliness, because I am, of course, sensible that my views must be very susceptible of improvement. There is great room for ingenious scientific adaptation in these respects, and it is plain that these means cannot reach their highest points of simplicity, effectiveness, and economy, at once.

Amongst the persons with whom I have communicated on this subject is Mr. Daniel Siebe, the talented and skilful constructor of the machine for making ice on an extended scale by the ingenious process conceived by Mr. James Harrison, of Australia.[*] These two gentlemen have succeeded in producing a perfectly effective machine, driven by a ten-horse engine, capable of making 8,000lbs. of ice in twenty-four hours, at an expense (in London), including interest of money and every working charge, not exceeding ten shillings per ton, which I believe I am correct in saying, is at least fifty per cent. cheaper than the ice can be landed on the wharves of this river from abroad.

They have further placed us in possession of simple, efficacious, and inexpensive means of greatly reducing, as well as regulating, the temperature of apartments of considerable area, in tropical climates, as, for example, barrack-rooms, the wards of hospitals, courts of justice, prisons, &c.* It is much to be wished that her Majesty's Government, and more especially the Indian branch of it, may direct their early attention to this subject. The invention is of high interest, and susceptible of adaptation to a variety of important uses in the public establishments of the country with great advantage and economy. My service has been principally within the tropics, and I may therefore take this opportunity of stating that this machine is well worthy of the careful examination of reflecting persons publicly or privately connected with our possessions in low latitudes. Mr. Siebe's manufactory is No. 17, Mason-street, Westminster-bridge-road.

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[*] For a description of this machine see *Journal*, Vol. vi., p. 475.

This whole subject appears to me to recommend itself to the particular attention of the corporations of large cities, of the Chambers of Commerce of the chief ports of cattle export and import, and of the directors of the main lines of railway in Ireland and in England. It seems probable that the best mode of carrying out such projects would be by means of joint-stock companies, and I am strengthened in that impression by the opinions of persons of practical ability with whom I have conferred on the matter. But, at the same time, if this extended scheme should not immediately recommend itself to the public, there is good ground for the belief that the independent adoption of well-devised plans of the kind by proprietors of large estates in grazing districts, conveniently situated in the close neighbourhood of large cattle fairs or markets, as well as of railway stations, would be attended with handsome profits to the parties themselves, and substantial advantages to the surrounding country.

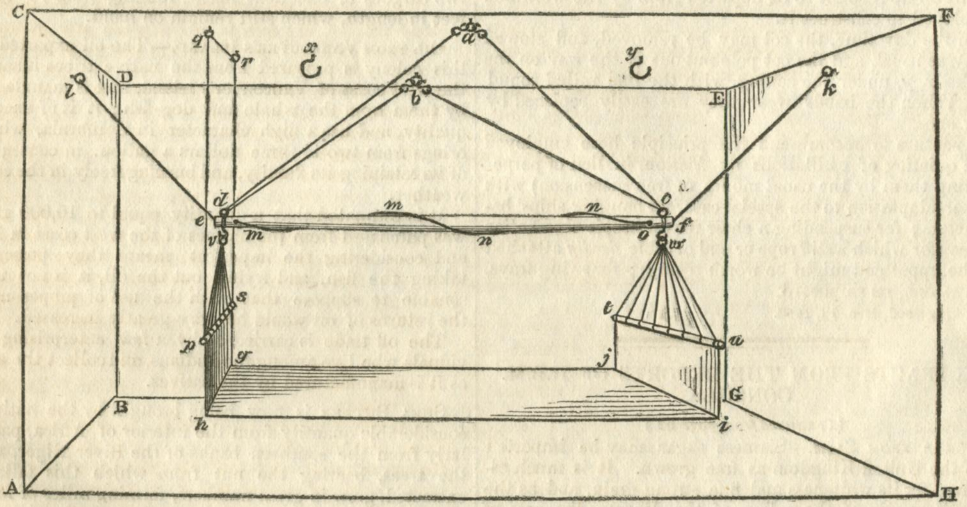
31, Kensington-park Gardens, W., Nov. 15, 1860.

SWING COT FOR SEA VOYAGES.

By Sir J. F. W. Herschel, Bart., F.R.S.

I beg to submit, for the consideration of the Society of Arts, the following mode of suspending a cot on shipboard where a whole cabin is disposable as a sleeping apartment (the cot being removable in the day time), as having, from experience in a voyage to the Cape and back, found it productive of a degree of comfort far surpassing any of the ordinary arrangements of swing cots or beds on jimbals which I have seen adopted; affording an invalid, in the roughest weather, the most complete immunity from all the ordinary causes of complaint arising from the pitching and rolling of the vessel, and entirely obviating any tendency to sea-sickness. Its principle is the reverse of free or jimbal suspension, and relies on friction as a means of deadening oscillation. As the figures annexed will speak for themselves, no lengthened description will be needed; and I will only add, as regards expense, that it may be fitted up by any ordinary carpenter and blacksmith at the cost of a very few shillings.

Fig. 1.



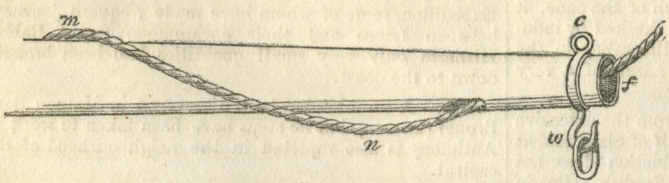


Fig. 2.

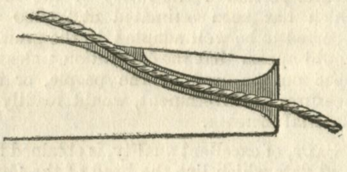


Fig. 3.

Fig. 1 is the interior view of a cabin with the cot, *g h i j*, suspended by the clews, *v p s t u w*, from the hooks, *v w*, at the end of the cot-pole, *e f*, which is itself suspended by cords or light iron rods *ac*, *bc*, *ad*, *bd*, of precisely equal lengths (when equally stretched), and which (if cords) are firmly knotted (so as not to run) to the rings, *c d*, on the upper side of the pole, and are furnished with hooks at their upper ends, *a b*,* attachable when in use to rings screwed on the starboard and larboard side of its medial line, or right athwart ship, into the ceiling of the cabin, the planes of which should be adjusted fore and aft. The cot-pole should lie exactly horizontal, and truly fore and aft when the ship is at rest, and the lengths of the cords or rods, *ac*, *bc*, *ad*, *bd*, should be adjusted accordingly.

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* A large provision-merchant at Hamburg, in the course of last summer, experimentalising on this plan, merely by way of trial, and with incomplete arrangements, succeeded in reducing the temperature, in about two hours, from 80 deg. to 40 deg Fahr. The apartment was seventy feet long by twenty-five wide. The expense was trifling, consisting of some feet of pipe (four inches in diameter) and a few pounds of ice and salt.

l e m m n n o f k is a friction band (cord is better than woollen list, which creates too much friction), attached by loops, *k l*, to the fore and aft walls of the cabin, and passing into, through, and round the cot-pole in the manner represented in fig. 2 and fig. 3; the latter being a section, through the axis, of one end of the cot-pole, showing the channel through which the friction-band enters and emerges at either end. It is needless to remark that all this part of the work must be smoothly rounded to avoid cutting the band.

p q r s is a stout pack-thread attached to the cot at the foot, at *p q*, and passing through rings *q r*, screwed into the ceiling; the pack-thread being so tightened by trial as to destroy, by its friction on the rings, the effect of the ship's roll, as the friction band, *l m n k*, effectually does that of its pitch.

The figures are on no precise scale, which must depend on the dimensions of the cabin. The cot should hang about a foot from the floor, and the height of the pole should be adjusted accordingly. But every part here figured is essential to the well-working of the concern, and ought on no account to be departed from by the workmen employed to construct it.

In the day time, the cot may be removed, and stowed away as usual, and the cot pole put out of the way on the hooks, *x*, *y*, under the ceiling, with the line rolled round it. When the bands wear they are easily replaced by new ones.

I venture to recommend the principle here employed (the quieting of oscillations by friction, in lieu of perpetuating them by the usual modes of free suspension) with proper adaptation to the special case, for hanging ships' barometers; for suspending a chair for telescopic observation at sea (for which a stiff rope or end of cable *fixedly* attached at the upper end might be worth trying); for swing trays, lamps, &c., on shipboard.

Collingwood, Dec. 18, 1860.

EXTRACTS FROM THE REPORTS OF H.B.M. CONSULS.

(*Continued from page* 92.)

SUGAR FROM SIAM.—Siamese sugar may be imported into the United Kingdom as free grown. It is much esteemed for its whiteness and fine strong grain, and as the greater portion of the valley of the Menam, the area of which has been estimated at 22,000 square miles, is reported to be well adapted to the growth of the cane, it would appear that the cultivation, unless checked by indolence on the part of the people, or illiberality in the measures of Government, would readily admit of a very material increase.

SALT, of excellent quality, is obtained from the extensive mud flats which line the head of the Gulf of Siam, and at so cheap a rate, that the cost of production does not exceed from 2s. 6d. to 5s. for 3,4000 lbs. English. But in Siam, as in many other countries, salt has been selected by the Government as a special object of taxation, and the duty there amounts to from 12s. to 14s. per ton.

HEMP.—The growth of hemp in Siam is only just becoming known. It is particularly recommended on account of its great strength, and its glossy and silky texture—which would allow of its being woven up into silk fabrics. Its price is about 25s. per pecule, which will enable it to compete successfully with that of Manilla.

ANTIMONY.—Large quantities of antimony ore have been discovered at a short distance from Bangkok (Siam.)

GREEN MARBLE.—The Valley of Papenoo—the largest and deepest in the Island of Tahiti—affords specimens of pebbles, as well as blocks of lava, of felspar, of amphibole, and pyroxenes, analogous to the dionites and diorites; moreover, there are to be found masses of a green rock susceptible of a high polish and resembling serpentine.

COAL.—Coal is procured at the settlement of Nanaimo (Vancouver's Island), where the Hudson's Bay Company have made a large purchase of land and commenced an extensive coal work. Two valuable beds of coal, varying from five feet to seven feet in thickness, are found within 100 feet of the surface; the coal is bituminous and is greatly prized for domestic consumption and for steaming purposes. The produce of these works may be increased, by increasing the number of hands, to any desirable extent.

SHIP SPARS.—A source of wealth and enterprise may be found in the magnificent ship spars produced in Vancouver's Island, which, in point of size and comparative strength, are probably the most valuable in the world, and may be procured in any number, even were the demand to include the supply of spars for the whole British navy. A company was formed in this country for the exportation of ships' masts and spars to England; but the parties finding that they had not a sufficient command of capital for the undertaking, discontinued the business, after preparing two cargoes of excellent masts, ranging from 75 to 120 feet in length, which still remain on hand.

OIL FROM VANCOUVER'S ISLAND.—The oil exported from this colony is procured from the native tribes inhabiting the west coast of Vancouver's Island, and is manufactured by them from the whale and dog-fish; it is of excellent quality, and has a high character in California, where it brings from two to three dollars a gallon, in consequence of its retaining its fluidity, and burning freely in the coldest weather.

It is estimated that a quantity equal to 10,000 gallons was purchased from the natives of the west coast in 1854; and considering the imperfect means they possess for taking the fish, and frying out the oil, it is not unreasonable to suppose that with the use of proper means, the returns of oil would be very greatly increased.

The oil trade is carried on by a few enterprising individuals who live among the Indians, and collect the article as it is manufactured by the natives.

SHEA BUTTER is now being brought by the natives in considerable quantity from the interior of Africa, particularly from the southern banks of the River Niger, where the trees, bearing the nut from which this tallow is extracted, grow in great numbers, forming miles of forests. The value of this tree and its product has been pointed out to the natives by the officers attached to the Niger Expedition, some of whom have made frequent journeys between Lagos and their encampment near Rabba. Hitherto only very small quantities had been brought down to the coast.

TIN.—A tin mine has been discovered in Maluan Bay, Brunei (Borneo), but no steps have been taken to work it. Antimony is also reported in the neighbourhood of the capital.

MARBLE.—There exists near Tlemcin, province of Oran, Algeria, a quarry of translucid marble; and near the Cape de Fer, betwixt Philippeville and Bona, there is a quarry of marble, which resembles the white Ferrara.

RAW SUGAR FROM BEETROOT, manufactured at Dunkirk, is imported into England, where, after being refined, it can be sold for 5½d. per lb.; if refined at Dunkirk, and sold there, the same sugar costs 8d. per lb.

EARTHENWARE.—The duty on the import of earthenware in the Zollverein being nearly as high as the first cost in Great Britain, some merchants have established a pottery on the Hanoverian territory, at a short distance from Bremen; the major part of the workmen, as also of the raw material, being obtained from England.

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* These hooks should be well oiled, or they will scroop horribly.

Cochineal.—In consequence of the continuation of the vine disease in the island of Madeira, since the commencement of 1852, the cultivation of the cactus for the propagation of cochineal has increased, and is likely to become a source of considerable profit to the island.

The production of cochineal in Teneriffe has made immense strides during the last ten years.

Orchill.—Iniack Island, open on all sides to the spacious Bay of Delagoa and the Indian Ocean, is believed to be the only British possession where the orchilla weed grows in any abundance.

Orchilla weed is found in enormous quantities all over the island of Madagascar.

Pearl Fishery.—It is believed that if the pearl fishery of the Bazarzetto Islands, in 21 deg. 30 min. south latitude and 35 deg. 33 min. east longitude, were properly worked and protected, they would soon rival those of Ceylon.

India Rubber and Gutta Percha.—A tree yielding india-rubber and the gutta-percha tree are both found in large numbers on the banks of the Zambesi river, and the Governor-General of Mozambique has been requested to issue an order forbidding any gutta-percha tree being cut down, and pointing out that they should be tapped longitudinally for the extraction of the juice.

Neat's Foot Oil.—Quantities of neat's-foot oil, obtained from the wild animals of Abyssinia, are sent to America.

Wine and Silk.—In Ancona the vine disease has continued for six years, and the good wine which formerly cost three-halfpence per bottle is now fourpence-halfpenny per bottle, which is considered excessive. The mulberry plantation is yearly increasing throughout the country to augment the production of silk.

Salt.—Much attention is now being paid to the production of salt in the Crimea. It is obtained from several lakes which annually deposit large quantities on the evaporation of the water by the heat of the sun.

Potato.—The cultivation of the potato in Poland is stated to have increased sixfold. The harvest, in 1857, amounted to 8,750,000 quarters, of which 1,750,000 quarters, besides 214,723 quarters of grain, were used in the distillation of spirits, yielding upwards of 12,000,000 gallons, or nearly 2¾ gallons for each head of the population.

Pulu is an article of considerable export from the Sandwich Islands to Francisco. It is gathered from tree-ferns principally, on the Island of Owhyhee, and is used instead of feathers or horse-hair for mattrasses. A sample was sent to Mr. R. C. Janion, in the *Antilla*, an English brig, on her return to Liverpool, in 1858.

Coal.—The coal mines of Cadibona, in the mountains near Savona, in Sardinia, have been neglected till within the last few years—they are now being worked with some energy. They give employment to about 300 men, exclusive of those engaged in transporting the coal to the port of Savona for shipment. Two-thirds of the produce are consumed in the state, the other third is exported to Alexandria. The coal is of a very inferior quality to English coal, and is used for brick-making, for the glass-works of Savona, and for the small coasting and harbour steamers.

Minerals in Spain.—Several mines have been discovered at Santander, in Spain, consisting of calamine, copper, and iron, which are exported to England, France, and Belgium, from the ports of Santander, Suances, and Comillas, where a French company has been established for working them.

The Merino Sheep was introduced into Greece by Ibrahim Pasha, but has now disappeared.

Mules.—Naturalists may be interested in knowing that in Aleppo a mule, between a donkey and a cow, is now and then met with. Its appearance is very striking—in shape like its mother, but with solid hoofs, and without horns.

Timber.—The forests and mines of Bosnia are well worth the attention of British capitalists. The forests have proved a source of wealth to many Austrian and French speculators; and, considering the advantageous terms on which foreign traders can acquire the right of cutting timber, it is strange that British enterprise is still unrepresented here. The Turkish Government merely requires ten per cent. on the amount of timber exported from the province, and is content to receive the impost in kind. One French firm exports annually a million of Bosnian oak barrel staves. The length of the logs cut is necessarily limited, as they have to be transported on baggage animals.

Iron.—The iron of Bosnia is of excellent quality, the best resembling Swedish. It is held in great request at the manufactories of Gratz, in Styria, and large quantities pass into Dalmatia and Servia, in the form of horse-shoes. It is found in the form generally known as hown iron ore, and yields thirty-two per cent of pure metal.

Silk Reeling at Brussa.—A single reel, as worked in the filatures at Brussa, tended by one girl, may wind off ninety to ninety-five Turkish drachms (or 10¼oz.) of silk per day on the average throughout the year, giving, after deduction of Sundays and holidays, for 265 working days, a total of 631,000lbs. of silk, the produce of 3,712 reels worked in eighty-two filatures.

Latakia Tobacco.—The best exported from Latakia is that produced in the district of Gebel. When this has been hung up in the rooms of the peasants, and there allowed to absorb the smoke of the dwarf oak, it gives a delicious perfume in smoking. It is then called Abu Richa (Father of Scent). It is worthy of observation that the Abu Richa improves a great deal after having been some days on board ship. In Egypt it is in great demand. The peculiar property which this tobacco derives from being exposed to the smoke was accidently discovered as follows:—One year there being no demand for tobacco, the leaves were hung up for the winter in the peasants' huts, exposed to the continual smoke of their fires, and the succeeding year it was sent to Egypt, where it was considered so good that a large order was sent to Latakia for more of the same quality, which was then called Abu Richa.

Industries of Antwerp.—The principal industrial establishments at Antwerp, and other ports within the province, consist in yards for ship-building, breweries, distilleries; sugar, salt, and sulphur refineries; bleacheries; woollen, lace, flax, oil, and soap factories.

Colonial Correspondence.

THE COMMERCIAL VALUE OF TASMANIAN TIMBER.

Sir,—In bringing the subject of our Tasmanian timber under the notice of the Society of Arts, I have not directed attention to the value of our timber in the neighbouring colonies of Australia, but have confined myself to the question of its probable value in the English market, and to the grounds upon which the estimate of that value is based.

Public attention in Great Britain appears to have been particularly attracted lately to the subject of timber,—not only in connection with the requirements of the ship-builder, but also to meet the extensive demand which is arising for the supply of railway sleepers, to replace those which, from decay, have become unserviceable.

There are three kinds of Gum Trees (*Eucalyptus*) in Tasmania, the timber of which has been found, from constant and long experience, to possess great value for the purposes of the ship-builder, the mill-wright, the carpenter, the implement maker, and the engineer. The best kind of gum timber is generally admitted to be that of the "Blue Gum." (*Eucalyptus globulus*, Lab.) The timber of the "Stringy-bark" (*Eucalyptus gigantea*, Hook, fil.), and of a variety of the "Peppermint Tree" (*Eucalyptus amygdalina*, Lab.), is also greatly prized, and extensively used, for the same purposes as the timber of the blue gum.

All these kinds of timber, especially the two first-named, are particularly adapted for works requiring enormous span, strength, and stability, on account of the great size of the beams which they afford. As an instance, I may mention a plank of blue gum, (which was forwarded for the Great Exhibition in 1851, but arrived too late), the length of which was 145 feet, its breadth 20 inches, and its depth 6 inches. Another plank, of the same scantling, has since been cut, 160 feet in length. The specific gravity of all three kinds is greater than that of Morung Saul, and, of course, considerably greater than that of English oak and East Indian teak. The weight of a cubic foot of blue gum is about 55lbs.; and a seasoned piece of it, 2 × 2 and 7 feet long, will not break until loaded with 1,300lbs. Many vessels, of various tonnage, have been built of blue gum in Tasmania, some of which trade regularly between this Colony and England,—the greater number being employed in inter-colonial commerce. It is in constant use in the Colony for a great variety of purposes, and is held in the highest repute.

Nearly as much may be said of the timber of the stringy bark and of the peppermint tree. The stringy bark abounds in the northern parts of Tasmania, while the blue gum is confined to the southern side. The peppermint tree is more generally diffused throughout the island.

It seems to me that it would be our best course to send, in the form of railway sleepers, all the timber which we are prepared to deliver in England at a low price, leaving the question of a supply for ship-building until there should be a demand for it.

Timber-merchants here would be able to deliver blue gum railway sleepers, 8 × 4 and 9 feet long, in London, at the price of six shillings to seven shillings a sleeper, to the extent of about 70,000 sleepers annually. If the price were raised to eight shillings and sixpence a sleeper, I should think that the quantity exported might soon be doubled or trebled. About 50,000 railway sleepers of stringy bark could be delivered in London at about seven shillings and sixpence a sleeper. The quantity could be greatly increased if a better price were to be obtained.

Now it has been ascertained, beyond a doubt, that the blue gum and stringy bark timber, but especially the former, will remain sound, as planking for ships and barges, for a period of twenty years, when it has been felled at the proper time of the year, and thoroughly well seasoned. It will also last quite as long in the form of sleepers, laid on the ground. It is likewise very durable when in contact with salt water, as piles for wharves and bridges, as well as in the planking of ships.

It is not to be expected that the timber of Tasmania would continue to command a good price unless great care were taken that none of the inferior quality should be sent into the market. To prevent fraud it would be necessary that an Inspector of Timber should be appointed, who should stamp each end of every sleeper or other piece of timber with a mark, the imitation of which should be regarded as felony. A certificate, signed by an authorised officer of the Government, should also be given to every exporter of timber, setting forth the quantity and kinds of timber shipped by him for the English market, as reported by the Inspector. Notice of this regulation should be given to an agent of the Tasmanian Government in London, from whom authentic information might be obtained by purchasers, in order to prevent imposition, and to preserve the character of the timber of Tasmania from the danger of falling in public estimation.

Owing to the want of proper attention to the conditions under which timber is rendered most fit for use, and to the neglect of proper selection, the blue-gum timber, although of excellent quality, has not obtained that rank at Lloyds' to which we think it entitled. It is confidently assumed that such errors will not occur in future; and that greater precautions, and a better knowledge of the best varieties of our timber, may enable us to establish for it such a reputation as it deserves.

When the cost of sleepers of larch and other soft woods is considered, together with their tendency to rapid decay, and the expense of rendering them more durable, it is scarcely being too sanguine to expect that a demand will arise in England for Tasmanian timber, seeing that it is a hard, dense wood, and will last for a very long period, without the necessity of being submitted to any process for rendering it durable, and that it can be supplied at a moderate price.

Under these circumstances I feel thoroughly justified in commending the timber of Tasmania to the notice of engineers and builders in England, and I do it in accordance with the request of the Council and Fellows of the Royal Society of Tasmania, to whom the subject of the communication from the Society of Arts, asking for information relative to the productions of the Colony, has been referred by the Local Government. At a future time I may be in a position to bring other products of this island under the notice of the Society of Arts; but in the meantime we shall feel greatly indebted to the Society, if, through their support and influence, we are enabled to obtain a footing in the English market for our timber.

I am, &c.,
WILLIAM ARCHER, F.L.S.,
Secretary to the Royal Society of Tasmania.

Home Correspondence.

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THE HULLAH FUND.

SIR,—The *Journal* contains an advertisement of the "Hullah Fund," to which I am anxious to call the attention of the Institutions in Union with the Society of Arts, for Mr. Hullah is a great public benefactor, who has done more than almost any other individual to promote the instruction and recreation of the masses of the people.

I was in the Education Department when his system of teaching music was first introduced, under the sanction of their lordships, and I have a lively recollection, not only of the ability and enthusiasm, but also of the fastidious disinterestedness which characterised his conduct. I should be sorry to do the least injustice to others, who, some of them at an earlier period, have laboured to make music popular; but, acknowledging the merits of Mr. Hickson, Mr. Turner, Mr. Mainzer, Miss Glover, Mr. Curwen, and others, I do not hesitate to say that, of vocal music amongst the masses of the people in England, Mr. Hullah has been the chief apostle.

When the Committee of Council on Education was first established, the secretary, Dr. Kay, now Sir James Kay-Shuttleworth, was anxious to bring to the knowledge of elementary teachers in this country some of the scientific "methods" of teaching which had received acceptance in France, Switzerland, and Germany. The elementary teacher in our National and British Schools of those days had little or no method in his teaching. The idea of a progressive lesson, in which each step of the learner is a natural consequence of a previous step, and a natural preparation for a further step, was seldom realised; the improved lesson-books of the Irish Commissioners of Education were more distrusted than known; and the school books commonly in use, of which there was a miserably scanty supply, were so indifferent that they have since been almost all superseded by an improved stock. The secretary of the Committee of Council induced their lordships to take measures to procure the publication of certain "methods" which might serve as examples, *e.g.*, "Wilhem's Method" of teaching singing; "Dupuis' Method" of teaching drawing; "Mulhauser's Method" of teaching writing; "Pestalozzi's Method" of teaching arithmetic; and the "Lant" or "Phonic Method" of teaching spelling. At this juncture, and before any steps had been actually taken for the publication of any of these "methods," Sir James Shuttleworth heard that Mr. Hullah had, in manuscript, an English version of Wilhem's method, and was preparing to introduce it as a means of teaching large classes of pupils to sing from notes. That MS., subsequently elaborated and perfected by Mr. Hullah, to an extent which makes it an original work vastly superior to Mr. Wilhem's, is the now world-famous "Manual of Vocal Music," which has been the Lesson-Book of millions of pupils—children and adults; which has carried music into thousands of families; which has brightened the intelligence, sweetened the temper, and destroyed the monotony of thousands of schools; which has created an innocent and improving counter-attraction to thousands of haunts of idleness and vice; which has changed for the better the whole character of the Service in thousands of churches and chapels; and which, in the admirable clearness and gradual synthesis of its lessons, has proved one of the most successful examples and models that we have had (since the publication of "Euclid") for the construction of the improved Lesson-books of late years.

Mr. Hullah's singular success in teaching "the masses" to sing, and the happy results which were evident in the conduct of those taught, had a great effect in breaking down the narrow barriers within which it used to be the fashion to restrict the education of the poor, and in reconciling old-fashioned persons to the modern system of Mechanics' Institutes and Athenæums for the instruction and amusement of adults; and in this point of view I am convinced that we should do him scant justice if we attributed to him an influence for good exclusively in connection with music.

Some persons have supposed that Mr. Hullah received large sums from the Government. This is quite a mistake. The Committee of Council on Education gave to him their "sanction," *i.e.*, their patronage; and received from him, in return, an immense increase of their popularity and of facilities for carrying out their views; and when his classes at Exeter-hall were producing a profit which, if he had been unhonoured by the "sanction" of the Privy Council, would have gone into his own pockets, he had to forego that profit in order that it might make good the deficiency occasioned by the other classes of "method" for drawing, writing, and arithmetic, which were held "under the sanction of the Committee of Council" in connexion with his classes.

Having seen abundant instances of his disinterestedness, of his postponement of his own interests to those of his great object—viz., to naturalise in the United Kingdom the power of singing at sight, I feel no surprise at learning that his success in the service of the public has not been attended by sufficient pecuniary receipts; and now that the fire at St. Martin's-hall has produced a crisis, there is naturally a general desire to offer to him some encouragement and help in a substantial form.

That the bishops and clergy, and other ministers of religion, will hasten to prove their gratitude to him who has done such great service to the churches and chapels of all communions among us, no one can have any doubt. That a like zeal will be found among laymen of all classes, I am sure: but I beg permission to point out to the Secretaries of Institutions that in many cases they might afford a valuable co-operation to the Committee of the Hullah Fund by organizing in the towns and villages the means of collecting subscriptions, however small, and of transmitting them to the Committee in London.

I am, &c.,
HARRY CHESTER.

COPYING PICTURES IN PUBLIC GALLERIES.

Sir,—I fear that in my anxiety to avoid trespassing on your valuable space, I must have been too concise to be sufficiently explicit. But as your correspondent who signs himself "S. R.," has renewed the subject, I, in default of some one better able to plead their cause, have again taken up my pen in behalf of a large and respectable body of artists.

I will first of all correct a few important inaccuracies in "S. R.'s" statements, as they are all made to swell up the charges against the unfortunate copyist.

Firstly, the works of modern painters, at the Kensington Museum, are open to the public six days in the week, and not restricted, as he says, to four—the students' days are those on which the admission is 6d. Even were the public not admitted on those days, there would be no economy in neglecting to keep up a proper degree of warmth, therefore nothing extra is expended on account of the students; it may, perhaps, be superfluous to add that the light of day is also quite innocent of any call on the public purse.

Secondly. "S. R." describes the objects an art student has in the gallery, but very much understates the time necessary to study there. I think the period may be safely taken at from two to three years, even in cases where students subsequently become artists of acknowledged talent. Furthermore, it may be well to bear in mind that during the term of study rising genius must eat, and many a student, by selling his copy, procures funds which enable him to prosecute his studies. I must protest against this being termed an abuse of a privilege.

Thirdly. It is not the case that "copyists never become artists," for I know of many instances of young men who, commencing their career by copying, have now become artists of repute. I am now speaking of a time preceding the opening of the Vernon Gallery. When that gallery was thrown open to copyists, I saw many artists there, whose names are now favourably known in the profession. I will here just parenthetically suggest that, bad as many of the copies undoubtedly are, they (if sold) must necessarily be as good as the taste of the purchasers.

Fifthly. I can feel for the sensitive artists, but there is no more help for them than for sensitive composers, and we must make up our minds to excuse imperfections in painting, as in music and other arts. All our great artists must have painted but indifferently at first. But "S. R." falls into a great error when he says that "the artist has always felt much delicacy himself in making a replica of a picture which has passed from his possession." This is so utterly opposed to what is a well-known fact, that I am quite at a loss to understand how such a statement could be ventured on. What an artist's feelings may be it is difficult to define, but the number of replicas painted every year speaks volumes for the successful manner in which they overcome the weakness, if any exists. So general are these repeats, that I think I am warranted in concluding that the supply is governed by the demand. One more mistake, and I have done with "S. R." The permission to copy works of modern painters has been granted ever since we had a national collection, and the same privilege exists on the continent, as far as my knowledge goes, and I have heard of no instance to the contrary. The prohibition as regards the Vernon collection was but a short-lived innovation, never, I hope, to be resuscitated, for admitting, for the sake of argument, that a small amount of evil does result from the practice, there is, as all admit, so much good that such a restriction could scarcely remain in force.

I now come to the question on which I see we differ, and I feel, as it is in a great measure a mere matter of opinion, on which surmises and vague charges are made to do duty for facts, that I shall have scarcely anything tangible to refute.—I think the question as stated in your *Journal* three weeks ago, and repeated in your last number, is, that certain individuals gain a living by copying modern pictures in the public galleries, and that the practice is injurious to Art. The example given is, that more than one person gains a living by copying "The Age of Innocence," and that the copies are sold to the public, by dishonest dealers, as replicas of the original artist; but of the latter no instance is given. Now, as the punishment for such a fraud is the same as that for obtaining money under false pretences, it must be pretty evident that pictures in public galleries are little likely to be selected, owing to the greater risk of detection their publicity involves. If, however, any facts bearing on this point are known, let a case be made public, or investigated, so that, if practicable, the delinquent may meet the punishment so richly deserved.

The professed copyist is often an artist who becomes such from lack of patronage, opportunity of exhibiting, mistaking his vocation, (a discovery generally made too late,) or want of means; for no one would voluntarily select such a profession, but seek to escape from it as soon as possible. They are required by the public, or they would soon cease to be; nor can I believe that their more fortunate and more gifted brethren begrudge them the moderate amount they wring, by the merest drudgery, from art. Whether the sale of copies is an advantage or otherwise, is so much a matter of opinion that I can only give as mine that nothing conduces so much to the advancement of art, and the education of the public taste, as the distribution of copies of good pictures among those classes to whom the originals are inaccessible, and that the original artist eventually receives the most benefit from the increase of art purchasers.

Before concluding, I avail myself of the opportunity to suggest that if the Society of Arts is desirous of using its great influence in promoting the advancement of the Arts, there is ample scope for exertion in endeavouring to procure adequate space for the annual exhibition of works of art, and the establishment of national drawing academies for the instruction of art students on a scale commensurate with the requirements of the present day.

I am, &c., F. W. R.

January 2, 1861.

INCRUSTATION IN STEAM-BOILERS.

Sir,—All the world knows that the incrustation in steam-boilers is deposited from the water, and that, in tubular boilers, it is very difficult to get rid of; but few are aware that "blowing out" a boiler, to get rid of the sediment on the bottom, hardens the sediment that adheres to the tubes, converting it into a calcareous shell, requiring a smart blow of a hammer to dislodge it.

Will you oblige me by giving to the world, through the columns of your *Journal*, a very simple and efficacious remedy?

I tried the experiment on a 30-horse tubular boiler. In addition to the blow-off cock at the bottom another was fitted over the fire pan, at the usual level of the water, and to the end of it, inside the boiler, was screwed on a funnel of sheet-iron, partly flattened, so that, on the cock being opened, anything floating within eight or ten inches on each side was drawn through.

The engine-driver had directions to open the lower cock once a day, and the upper one when he saw the water in the glass gauge was thick, and keep them open until the water ran clear, but never to blow out the boiler, as formerly. Three or four gallons from the lower, and half that quantity from the upper cock was sufficient to carry off all thick and dirty water.

At the end of *three months*, first allowing the water to get nearly cold, the boiler was emptied; a stream of water was then introduced by the man-hole, and the tubes thoroughly washed. On examination the under half of the tubes was as clean as the day they were made, the upper half discoloured but no scale, and the sides of the boiler in a similar state; on the bottom was about half a bushel of thin scale, broken up into small pieces, that apparently had fallen or been washed from the tubes; thus, after three months' work, there was nothing to do but to get up steam again.

The secret consists in never blowing out the boiler when hot, the usual custom, as the result is—the heat of the tubes and sides instantaneously convert the soft deposit into a hard calcareous substance, and every time the boiler is blown out an additional stratum is added. If the man-hole is taken off on the Saturday afternoon, and the flues opened, the water is cold enough to run off by Monday morning, so that no time is lost, and I have no doubt the hot water might be allowed to run off on the Saturday provided an equally large stream of cold water was allow to run in at the same time, until the boiler and tubes were cold.

I will merely add, the water was pumped from the Thames, and allowed to settle, before being used for the boiler. There is no reason why the plan should not answer equally well for locomotives.

I am, &c.,
HENRY RANSFORD.

Brompton, Dec. 19, 1860.

ITALIAN HEMP.

Sir,—In the discussion that followed the very interesting paper of Professor Leone Levi, "On Italian Commerce and Manufactures," I made a few observations on that valuable product, the hemp of Italy, but in the report of my remarks in your *Journal*, one or two errors occurred. It was about 35 years ago it was first generally used in this country, and not 25, as stated. And in the observations of the Barking fishery for trawling and deep-sea fishing, it is stated our firm introduced the Italian hemp for cordage; it should have been "Italian hemp tanned twine for their trawl-nets." A smack-owner tried one part of a net with Russian hemp twine, the other portion with Italian twine. He assured me that the Russian hemp portion had to be renewed with the same material several times before the Italian hemp portion was worn out.

Few persons are aware of the great importance of our deep-sea fisheries. The town of Barking, in Essex, alone sends out about 300 sail of vessels, besides a great number from Greenwich to Gravesend, vessels ranging from 40 to 80 tons each, costing, upon an average, £1,300 when ready for sea, and the working expenses of each vessel about £900 per annum, taking a vast number of parish apprentices, and training up a hardy race of seamen.

My observations on the use of Irish flax for rope may require some explanation. There are three modes of preparing flax from the straw; one, the old method of steeping, and drying on the grass; also, dew-retting, merely laying it on the grass for a certain time, and occasionally turning it until ripe; the other, a more recent method, adapted for coarse purposes; the flax straw is crushed, when dry, in a green state, without steeping, and then scutched; this leaves all the vegetable matter in that is got rid of in steeping. It is a far less troublesome plan than the old method, and at the present time a very ready market is obtained for it at £35 per ton if well cleaned.

Four tons of flax straw produce one ton of clean, marketable long fibre, and about one ton of scutching tow, worth about £10 per ton, by McBride's efficient scutching machine. The prejudice of landlords is fast giving way to a more enlightened policy, as to the exhausting nature of the crop. It is found that, by feeding stock with the seed, more is returned to the land than is taken out of it. Mr. Druce, the eminent agriculturist, near Oxford, has grown it for years, and for a long time for the seed alone, allowing the flax straw to be trodden under foot in the rick yard for manure, but has now for some time turned the straw to a profitable account. He expresses his astonishment at many agriculturists spending hundreds of pounds yearly on foreign oil cake, when they can produce a better article, without any adulteration, on their own farms as a stolen crop.

The great difficulty, in the first instance, was to find out the almost *homœopathic dose* of seed to give the cattle, one peck of seed crushed being sufficient for twenty gallons of water, boiled to a mucilage; this, I believe, is sufficient for twenty bushels of chaff put into a large tub, and the mucilage poured over it and allowed to soak for some time; the cattle eat it with the greatest avidity, even if the chaff is composed of musty hay, &c., food they would not touch without the aid of linseed. One acre of good medium land, with 2½ bushels of seed, will produce on an average two tons of flax straw, worth from £4 to £5 per ton, and 16 to 20 bushels of seed, worth about 8s. per bushel.

The flax should be pulled as soon as the root-ends turn brown, which would be about the end of July; and if the land were required for turnips, the straw should be removed to a meadow for ripening the seed; if it is allowed to ripen before pulling, the fibre is much deteriorated. The land is then once ploughed and 3 cwt. of guano harrowed in. Drill in green or white turnips, and there will be as fine a crop, if not better, than if put in by July without the previous crop of flax.

I am, &c.,
EDWIN WARD TRENT.

Homerton.

PLASTIC WOOD.

SIR,—Observing, in the last number of your Society's *Journal*, a short article on the above subject, extracted from a communication to the *Times* by its Paris correspondent, I venture to offer a few observations, which may prevent erroneous views from being taken in connection with this invention.

I endeavoured, about ten years ago, to produce ornamental plastic wood, by the application of pressure and softening the woods, and succeeded to a certain extent, by cold pressure, but without softening the wood; but, as I had anticipated, the "relief" was of very slight depth. Several kinds of wood are capable of being softened by boiling or steaming, (the process adopted for knife-cutting veneers and bending sticks, shafts, and other carriage and ship-building work), but very few indeed can be sufficiently softened to replace the carving for furniture-making. Those foreign woods which are figured by fibres, or various excrescences, or which have fibres traversing the annual rings, are by no means adapted for that purpose. Equally unsuitable are dark-coloured woods, in which, even when the impression is successful, the outline of the "relief" is much less distinct than in light-coloured ones. Of the latter, lime-tree, poplar, and willow, might be used effectually so far as regards the sunk parts of the ornaments, which could easily be pressed into the softened wood, but it is very improbable that the raised parts, retaining the original soft nature of the wood, would ever become sufficiently hardened to resist the effects of time. To apply a chemical remedy would not only be costly, but also detrimental to the texture and colour of many woods, especially oak; the mere application of water or steam to oak will change the colour from an agreeable pale-yellow to an unpleasant reddish hue.

Walnut is, indeed, susceptible of being easily softened; but although it is much liked in England for some descriptions of furniture, when it is richly figured, the plainer sorts would, on account of their dull colour, probably meet with little favour for the imitation of carving.

Several East Indian, Chinese, and Brazilian woods might be named which, being soft as sponge, and yet fine-grained, are especially suitable for pressure, but they are all open, and even to a greater degree, to the objection which I have suggested against the use of the English light-coloured woods. Such delicate carvings as are executed with the chisel by Mr. Rogers and other sculptors, can certainly not be produced by pressure; while if, as we may presume from the list of articles named by the inventor, only a shallow description of carving is aimed at, this can be executed with great nicety by the turning lathe on the "guilloche" system, frequently used for portraits in ivory and wood, and now very much applied to straw-coloured coach-panels, imitating basket-work. But if the imitation of carving of a more raised character be wished for, I believe there is nothing so well adapted as leather ornaments, which have now been brought to an excellent state, and are not very expensive.

As everything connected with wood is in the highest degree interesting to me, I am anxious to obtain as much information as possible on any new invention relating to it; and hope these lines may give occasion to a closer investigation of the subject, which would be much facilitated if the inventor would forward a few specimens to your next Exhibition. The few* which accompany this letter are the results of experiments made ten years ago, and were only intended for book-sides, but found no favour for that purpose.

I am, &c.,
FRANCIS STEINITZ.

London Parquetry Company, Camberwell.

MODERN HOSE.

SIR,—Can any of your contributors solve the great stocking question?

Time was that grey woollen hose and black woollen hose, and sky-blue woollen hose, were knitted by hand, and were at least as durable as the breeches that surmounted them. There were also lambs'-wool white hose, undeniable in their utility; and it is quite clear that in Switzerland—the paradise of woollen hose—durability must be a *sine qua non*. Neither chamois-hunter nor shepherd could afford to darn his hose every night after the day's work.

Yet to this condition must they come, if the stocking disorder, now so rife in England, has penetrated there. We have woollen hose—scarlet, and blue, and black, and brown—exquisite in their colouring, but they are not hose at all in the sense of a durable covering to the legs. It would need a pair new every day to keep up the wear-and-tear. We have got to the condition of Mr. Carlyle in the matter of shoes, and must go shrieking through the land for any craftsman to rescue us from our trouble, by producing, in hose, a veritable antique durability.

"Ah! where is there a bonny boy
Will win both hosen and shoon?"

Is the rot in the wool as well as mutton, or is it all shoddy, that has served as materials in fifty different garments, and has at last been cast out from Houndsditch, treated with cleansing acids till it has neither coherence nor staple left; or is it the felt cloth disagglutinated once more, and shred into a bad likeness of wool, or is it in the dye? Has the process of extracting a brilliant scarlet dye from coal instead of cochineal caused it to be like a coal of fire to burn up the wool. Formerly scarlet cloth was stronger than black cloth, and now the condition is reversed. Come forth, then, wool men of Manchester or Leeds and solve the problem for us how the shops of London may, once more, be supplied with hose, *into* which, but not *through* which, the legs of her Majesty's lieges may be deposited. It is a question for a Manchester politico-economist to "tot up," the amount of waste resulting from such articles as now appear in shop windows, if a ship-load were sent to Australia, and worn out in one day. The breeding, the shearing of the sheep, the spinning, the weaving, the dyeing, the transport, the disappearance, and the vexation, practically throwing a mass of wasted labour with a profit on distributing on every stage in the transaction, falling at last on the unfortunately so called economiser, with practically nothing to consume.

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* The specimens may be seen at the House of the Society of Arts.

Waiting for Manchester or Leeds to reply,

I am, &c.,
W. BRIDGES ADAMS.

Proceedings of Institutions.

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Croydon Literary and Scientific Institution.—The last report of the Committee, presented at the annual meeting, held on Wednesday, October 10, 1860, George Curling, Esq., in the chair, states that the Institution has passed through another year of prosperity. At no preceding period has it added so much to its material strength and means for usefulness, and in no like period has there been so large an increase in the number of its members; the one step of its advancement being evidently connected with the other. It is now five or six years since the institution had fallen into a state of feebleness—with but few members, and a worse than exhausted exchequer. But from that time to the present, vitality has gradually increased, and it now possesses resources which have not been equalled in the whole history in the Institution. It is, therefore, with great satisfaction that the Committee submit the report to the members in the Croydon Public Hall; in taking possession of which, with the adjoining rooms, the Committee consider that the Institution has passed from youth into manhood, and has entered upon another and more responsible stage of its existence.

BALANCE SHEET FOR THE YEAR.

Income of 1st Quar.	91	11	7	Expenditure 1st Qr.	86	12	2½
„ 2nd „	176	13	1	„ 2nd „	122	7	11
„ 3rd „	78	0	2	„ 3rd „	85	11	8½
„ 4th „	59	10	4	„ 4th „	84	8	0½
Balance from last year	44	18	2	Balance in hands of Treasurer	71	13	5½
	£450	13	4		£450	13	4

By the balance-sheet it appears that the sum of £71 13s. 5½d. remains in the hands of the Treasurer, the expenditure having amounted to £378 19s. 10½d. Since the last annual meeting the Croydon Public Hall has been finished, and the Committee have become the tenants, at a rental of £100 for one year; this sum being agreed upon with the Public Hall Company, on condition of that body receiving one-half of all monies received for hire of the Hall to other parties, the Committee paying all expenses in connection therewith; provided also that the Committee pay a sum of two guineas for every lecture that may be delivered to the members of the Institution above twenty-four in the year. The number of members for the year has been:—First quarter, 590; second quarter, 655; third quarter, 588; and fourth quarter, 611—quarterly average for the year, 611. It is with some degree of satisfaction that the Committee point to the large number of members in the fourth quarter of the year, a result caused by the successful manner in which the conversazione of August 30th was carried out. It was an entertainment which gave great satisfaction to the members assembled, and one of its main features was—that those who catered for the amusement and instruction of those assembled were amateurs, to whom a special vote of thanks is due. During the past year 441 volumes have been added to the library—128 by purchase, at an expense of £8 10s. 7d., and 165 by gift, at an expense of £27 3s. to the donors, who subscribed specially to the library—in addition to which 148 volumes have been presented. Some books have also been purchased to replace those dilapidated, and a great many volumes have been re-bound. The following lectures were given at the expence of the funds of the Institution:—1859: Oct. 18, Mr. Edney, Musical Entertainment; Oct. 31, Mrs. Balfour, "The Buonaparte Family;" Nov. 29, Miss Julia Bleadon, "Operatic Sketches;" Dec. 22, J. K. Applebee, "Writings of Douglas Jerrold." 1860: Jan. 19, Miss Lizzie Stuart, "Scottish Minstrelsy;" Feb. 9, Walter Rowton, "Thomas Ingoldsby;" March 1, Henry Phillips, Musical Entertainment; March 7, W. Parsons, Esq., "Romance of the Law Courts;" March 20, C. R. Weld, Esq., "Arctic Discoveries;" March 29, Dr. Daniel, "Cardinal Wolsey;" April 9, London Quintett Union, Concert; April 20, Dr. Daniel, "Cardinal Richelieu;" May 17, The Brousil Family Concert; June 15, George Grossmith, "Sketches by Boz;" Aug. 30, Conversazione. Lectures were also given gratuitously by the following gentlemen, to whom special thanks are due. 1859: November 17. Reverend W. Mitchell, M.A., "Geometry of Nature;" December 27, Colonel Rowlandson, "A Year at the Cape;" Feb. 2, Reverend W. Shaw," "Kaffraria and the Kaffirs;" Feb. 24, Dr. Halley, D.D., "Paul at Athens;" March 15, Rev. R. Maguire, M.A., "My Schools and Schoolmasters"; May 3, Mr. W. Robinson, "Astronomy;" May 9, Rev. J. B. Owen, "Old School Affectations;" May 24, Dr. T. Spicer, "Character." The year's list embraces 24 lectures and entertainments; the average attendance has been 368. The singing classes are continued with success under the able direction of Mr. Budd. An organ is about to be erected in the Hall, chiefly for the use of the Choral Society of the Institution. This acquisition will, doubtless, tend to promote the cultivation of vocal music. Other classes will be organised whenever a sufficient number of members can be assembled for any subject that may be considered desirable; and the Committee hope the Discussion Class will be resumed at an early date. Soon after the Committee entered on possession of the Public Hall, a special meeting of the members was convened, and considerable alterations proposed in the rules of the Society. These were unanimously acceded to by the members. Whilst a small additional charge is made to the ordinary members now called second-class, a third-class has also been added, at a considerably lower rate of subscription, for whose use a second room has been added, to which members are invited at the rate of 5s. per annum, or 1s. 6d. per quarter. The ticket includes admission to the lectures and entertainments. The Committee also receive considerable support from a number of members who subscribe a guinea annually, but who never take any advantage of their right. The rules now allow those members to have four of these third-class tickets for each guinea subscriber, for distribution to their dependents. The Committee mentioned, in the last year's report, the "Croydon Public Hall Company," and a hope was expressed that the Trustees would be able to obtain 1,000 shares on behalf of the Institution;—this has been realised. The Committee hope in a short time to hold at least one-half of the capital of the Company; and if the liberality of their fellow townsmen should enable them to take part with the Public Hall Company in the purchase of the site, the prospects of the Institution would be materially strengthened. In accordance with the suggestions contained in the last year's report, the Committee invited the assistance of the ladies of Croydon in organising a Bazaar and Fancy Fair. This aid was cheerfully and zealously accorded, and triumphant success was achieved, about £560 having been realised.

Hastings Mechanics' Institution.—The quarterly meeting of members of this Institution was held on Wednesday evening, 7th November, in the reading-room of the institution.—Mr. Womersley (president) opened the meeting, and called upon the honorary secretary, Mr. J. Huggett, to read the report. The annual fête champêtre took place, and, as usual, was quite a success. Notwithstanding the drawbacks experienced on account of the weather, and the being obliged to postpone the fête until the next day, nearly £40 accrued to the funds of the institution. The committee have added about 100 volumes of books to the library from the proceeds of the fête; others will be added shortly. During the quarter 38 members have joined the Institution, and 16 have left. The present number is 327. A list of lectures to be delivered after Christmas is in preparation. 312 books have been in circulation during the quarter. The committee, in concluding their report, congratulate the members on the success of the Institution. The treasurer's report shows—Receipts during the quarter (including £38 14s. 6d. balance from fête), £63 10s. The expenditure has been £46 4s. 1d. (which includes nearly £20 expended for new books). A balance of £17 5s. 11d. remains in hand.—On the motion of Mr. T. S. Hide, the report was adopted, previous to which, Mr. John Banks observed that he did not notice any reference to classes in the present report. Had any steps been taken towards providing for their accommodation? It was a matter of too deep importance to be let drop entirely.—Mr. Huggett said that a notice paper for four classes had been placed on the notice board, and although it had been there four or five weeks, no class had obtained six names, without which it could not be formed. During some further conversation, it was stated that an opinion prevailed amongst a portion of the committee that the reason why persons did not offer to join the classes was their knowledge that no proper accommodation was provided for them; and also that an attempt had been made to get a room for classes in the upper part of the building, as well as in a house in the neighbourhood.—Mr. T. Edwards at some length remarked upon the whole question of classes, during which he expressed an opinion that there was not now so large a number of young members belonging to the institution as formerly, which would partly account for the apathy.—Some further discussion having taken place, Mr. Hide proposed a cordial vote of thanks to P. F. Robertson, Esq., of Halton-house, for allowing the use of his beautiful grounds for the purpose of the annual fête.—This was seconded by Mr. John Banks, and carried unanimously. It was suggested that the vote should be engrossed on vellum and framed, before it was forwarded to Mr. Robertson.

LICHFIELD FREE LIBRARY AND MUSEUM.—The second report of the Committee, presented to the town Council November 9, 1860, states that the news room goes on steadily, and the daily average attendance has increased during the year. The museum has since the last report been opened to the public, and the committee have every reason to be gratified at the unanimous satisfaction it has given to the citizens and visitors, who have inspected it in great numbers. The committee continue to receive valuable contributions of historical records and curiosities from many kind friends. With regard to the library, the committee much regret they have not been able to bring it into operation. The cost of additional works at the west end of the building, has entirely absorbed the funds at their disposal, and nearly £50 is required to place the books in the library before the readers. This sum the committee had hoped to have raised by the promised donations of some friends, and until nearly this amount is available, the committee are not in a position to fit up the library with tables, gas fittings, catalogues, &c., which are indispensable. The committee acknowledge with thanks the liberal contributions of many books during the year, thereby increasing the number to upwards of 2,000 volumes. Sir Robert Peel, Bart., M.P., has kindly promised to give a lecture during the winter, in aid of the funds of the Institotion.

LOCKWOOD MECHANICS' INSTITUTION.—The annual gathering of the members and friends of the Institution took place on Monday evening, the 24th December. At an early period of the evening the room was greatly crowded, and hundreds were unable to obtain admission. The chairman, Mr. S. Lodge, consequently announced that the committee had determined to adjourn to the Baptist School Room, where the accommodation would be more ample. The proceedings were very satisfactory. The singing class gave a selection of glees, which were followed by songs and recitations of an interesting and amusing character. During the evening Mr. J. H. Abbey gave a Shakesperian reading from "Macbeth." The programme, which was an unusually long one, had not been gone through when the meeting broke up.

MEETINGS FOR THE ENSUING WEEK.

MON. ...Entomological, 3.
Brit. Architects, 8.
Medical, 8½. Dr. Edw. Smith, F.R.S., on "The Action of Alcohol in the Treatment of Disease."
TUES. ...Syro Egyptian, 7½. "Account of Excavations made in Upper Egypt, by Mons. Mariette, under the direction of the Viceroy."
Civil Engineers, 8. Continued Discussion upon Mr. Preece's Paper, "On Submarine Telegraph Cables."
Medical and Chirurg., 8½.
Zoological, 9.
WED. ...Literary Fund, 3.
Geological, 8. 1. Rev. P. B. Brodie, F.G.S., "On the Stratigraphical Position of certain Corals in the Lias." 2. Rev. W. S. Symonds, F.G.S., and Mr. A. Lambert, "On the Malvern and Ledbury Tunnels and other Sections on the Worcester and Hereford Railway."
Graphic 8.
Microscopical, 8.
R. S. Literature, 8½.
Archæological Assoc., 8½.
THURS...Roy. Soc. Club, 6.
Philological, 8.
Royal, 1½.
Antiquaries, 8½.
FRI. ..... Astronomical, 8.

PATENT LAW AMENDMENT ACT.

APPLICATIONS FOR PATENTS AND PROTECTION ALLOWED.

[*From Gazette, December* 21*st*, 1860.]

Dated 7*th December*, 1860.

3006. W. Morris and J. Radford, Oldbury—Imp. in composition or compositions to be employed in the manufacture of fire-bricks, fire clay, lumps, blocks, retorts, and for all the purposes for which ordinary fire clay is now used, part or parts of which compositions may also be employed as a substitute for emery.

Dated 8*th December*, 1860.

3007. J. H. Cary, Norwich—An imp. in hammer rails.
3008. G. Davies, 1, Serle-street, Lincoln's inn—Certain imp. in the construction of steam boilers. (A com.)
3009. J. Robson, jun., North Shields—Imp. in mineral oil lamps.
3010. R. Mushet, Coleford, Gloucestershire—An imp. or imps. in the manufacture of an alloy or alloys of titanium and iron.
3011. T. Roberts, Holborn—Imp. in the construction of ships and floating batteries, and in rendering them capable of resisting the destructive force of shot, shell, and other missiles.
3012. M. Jones, Royal Mint—An imp. in apparatuses for preparing the edges of discs of metal for coin.
3013. A. Wheeler, Banner Cross, Sheffield—Imp. in the manufacture of railway carriages, trucks, engines, and other vehicles, so far as the balancing power, springs, and buffers are concerned.
3014. J. H. Johnson, 47, Lincoln's-inn-fields—Imp. in apparatus for applying capsules to bottles. (A com.)
3015. B. Hockin, Limehouse—Imp. in the construction and mode of fitting and working furnaces.
3017. D. Annan, 8, Albert-terrace, Bow—Imp. in furnaces and fire bars.
3018. J. Durrant, 63, Warren street, Fitzroy-square—Imp. in chimney pots, or apparatus for the tops of chimneys.
3019. W. E. Newton, 66, Chancery-lane—Improved machinery for making bricks. (A com.)

Dated 10*th December*, 1860.

3020. A. Granger, 308, High Holborn—Imp. in the manufacture of collars, cuffs, shirt fronts, clergymen's bands, stocks, and articles of a like nature.
3021. A. J. Filliette, 42, Rue Amelot, Paris—Imp. in presses for copying, stamping, and embossing.
3022. T. Peake, Derby—An improved method of locking or "skidding" the wheels of vehicles for the purpose of retarding or arresting the progress thereof.
2023. J. A. Barde, Paris—An improved portable apparatus for producing and purifying lighting gas.
3024. W. Clark, 53, Chancery-lane—Imp. in photographic apparatus. (A com.)
3025. J. Young and C. Cairns, Glasgow—Imp. in making moulds for casting.
3026. R. A. Brooman, 166, Fleet-street—Imp. in implements for digging and breaking up the soil. (A com.)
3027. R. Davison, London-street—Imp. in apparatuses for drying and heating.
3029. R. Hudson, Adwalton, near Leeds—Imp. in means or apparatus for the generation of steam.

3032. J. H. Johnson, 47, Lincoln's-inn-fields—Imp. in electric apparatus for striking the hours on bells. (A com.)

Dated 11th December, 1860.

3033. J. Townsend, Glasgow—Imp. in obtaining animal charcoal and other products from bones and other animal matters.
3035. C. Stevens, 1B, Welbeck-street, Cavendish-square—An impermeable anti-sulphuric coating for leather. (A com.)
3041. H. Tucker, 11, Queen-square, Bloomsbury—Imp. in bedsteads.
3043. J. Pym, 4, Lawrence Pountney-hill—Imp. in railway sleepers.

Dated 12th December, 1860.

3045. R. Mushet, Coleford, Gloucestershire—Imp. in the manufacture of cast steel.
3047. A. F. Jaloureau, Paris—Imp. in means or processes for holding, protecting, and insulating subterraneous telegraph wires.
3049. J. Scott, Sunderland—Imp. in reefing and furling sails.
3053. G. Richardson, Mecklenburg-square, and E. D. Chattaway, Bromley—Imp. in apparatus for enabling guards and engine drivers of railway trains to communicate with one another.
3055. S. C. Lister and J. Warburton, Manningham, Yorkshire—Imp. in spinning and doubling.

[*From Gazette, December 28th*, 1860.]

Dated 15th October, 1860.

2508. G. F. Goble and F. S. Hemming, London—Improved machinery for crushing quartz and other substances, and for mechanically and chemically extracting gold from auriferous stones or soils, and for procuring silver, copper, zinc, lead, iron, and other metals from their respective ores or impregnated liquids.

Dated 16th November, 1860.

2820. T. Welton, 29, New Compton-street, Soho, and E. H. C. Monckton, Parthenon Club, 16, Regent-street—Imp. in the application of electricity or magnetism to the human body for the relief of pain and cure of disease.

Dated 20th November, 1860.

2844. P. Palling, Esher-street, Lambeth—Certain imp. in fountain pens.

Dated 28th November, 1860.

2916. J. Robb, Aberdeen—Imp. in gas stoves.

Dated 30th November, 1860.

2938. J. Fry, Wrotham, near Sevenoakes, Kent—Imp. in the arrangement and construction of mills for crushing and grinding grain, seeds, oil-cake, and like matters, the crushing principle being also applicable to cements, minerals, and ores.

Dated 4th December, 1860.

2972. B. Greenwood, 5, Southfield-square, Manningham, Bradford—Imp. in the manufacture of brooms and other brushes.

Dated 10th December, 1860.

3028. R. H. Hughes, Hatton-garden—Imp. in means or apparatus for supplying fresh air to mines and other places.
3030. R. Mushet, Coleford, Gloucestershire—An imp. or imps. in the manufacture of an alloy or alloys of titanium and iron.

Dated 11th December, 1860.

3034. A. J. Canu, Paris—An improved pulverising and bruising machine.
3038. J. Townsend and J. Walker, Glasgow—Imp. in treating bye products arising in the manufacture of soda and potash, for the obtainment of antichlores and other useful products.
3040. G. C. Wallich, 17, Campden Hill-road, Kensington—Certain imps. in apparatus for taking deep-sea soundings.
3042. T. Massey, 4, Birchin-lane—Imp. in sounding machines.
3044. J. Steart, 5, St. James's-road, Blue Anchor-road, Bermondsey—Imp. in treating skins for the manufacture of leather.

Dated 12th December, 1860.

3046. H. Hall, Stack Steads, Lancashire—Imp. in machinery or apparatus for spinning and doubling fibrous materials.
3048. H. Newey, Birmingham—Imp. in the manufacture of certain parts of umbrellas and parasols.
3050. C. P. Moody, Corton Denham, Somersetshire—Imp. in the construction of gates.
3052. S. T. Cornish, Beaumont-square, Mile-end, Middlesex—Imp. in the construction of ships for rendering them shot and shell proof.
3056. R. Pitt, Bath, and S. F. Cox, Bristol—Imp. in apparatus employed in the manufacture of leather.

Dated 13th December, 1860.

3057. J. Casson, Wellington-street, Woolwich—An improved machine for dressing dried fruits, and separating and removing therefrom the stems and other refuse without injury to the fruit.
3058. J. G. Reynolds, 33, Wharf-road, City-road—Imp. in coating or covering the surfaces of smoking pipes and other articles, fictile, metallic, or otherwise, to obtain ornamental and useful effects.
3059. R. Henson, 113a, Strand—Imp. in eye glass and spectacle frames.
3061. C. Neville, Great Dover-road, Surrey—An improved washing apparatus.
3062. T. West, Warwick—An improved apparatus for slicing, shredding, and pulping turnips and other roots.
3063. S. Pitts, 14, Catherine-street, Strand—Imp. in billiard tables.
3064. W. Clark, 53, Chancery-lane—Imp. in the manufacture of gas. (A com.)
3065. Gen. O. Vandenburgh, London—Imp. in the breech pieces of breech-loading cannon.
3066. F. J. Evans, Horseferry-road, Westminster, and G. F. Evans, Brentford, Middlesex—Imp. in the manufacture of illuminating gas.
3067. J. R. Cooper, Birmingham—An imp. or imps. in breech-loading firearms.
3068. E. Jones, Manchester—An imp. or imps. in rifling small arms and ordnance.
3069. C. Reeves, Birmingham—Imp. in breech-loading fire-arms.
3070. R. Mushet, Coleford, Gloucestershire—Imp. in the manufacture of iron and steel.
3071. J. Chubb, St. Paul's-churchyard, and E. Hunter, Wolverhampton—Imp. in locks.
3072. W. D. Allen, Laithfield-house, Norfolk-road, Sheffield—Imp. in the manufacture of the bearings of "brasses" in which the axles of locomotive engines and carriages revolve, and also in the bearings, "brasses," and other parts of plummer blocks employed in machinery generally.
3073. J. A. Mello, Welbeck-street, Cavendish-square—Imp. in the manufacture of stereoscopic slides.

Dated 14th December, 1860.

3074. J. Fenton, Queen-street, Lincoln's-inn—An improved method of securing the wearing tyres on wheels.
3075. J. Jackson, 21, West-grove, St. John's-hill, Battersea—Imp. in lamps.
3077. W. Clark, 53, Chancery-lane—Imp. in signalling from one part of a railway train to another. (A com.)
3078. W. E. Newton, 66, Chancery-lane—Improved pavement for streets. (A com.)
3079. W. E. Newton, 66, Chancery-lane—Improved machinery for cutting and rounding corks and bungs. (A com.)
3081. H. Batchelor, Newport, Monmouthshire—Imp. in the construction and manufacture of models of ships, boats, or other vessels.

Dated 15th December, 1860.

3084. G. Davies, 1, Serle-street, Lincoln's-inn—Imp. in building bridges, ships, or other structures of iron or other metal. (A com.)
3086. G. Davies, 1, Serle-street, Lincoln's-inn—Imp. in the construction of iron or other metal beams, and in the machinery or apparatus employed for such purpose. (A com.)
3088. A. Kinder, Great George-street, Westminster—Imp. in machinery or apparatus for cutting wood.

INVENTION WITH COMPLETE SPECIFICATION FILED.

3153. W. J. Gibbons, Birmingham—Imp. in stereoscopes and their cases.—24th December, 1860.

PATENTS SEALED.

[*From Gazette, December 28th*, 1860.]

December 28th.

1575. J. Taylor.
1576. J. Soutter.
1583. A. Hawksey.
1592. E. Chetwyn.
1594. J. A. Salmon.
1565. W. E. Gedge.
1597. R. A. Brooman.
1600. C. J. E. Dumont.
1601. J. Haughton.
1603. R. N. Reid.
1008. T. Richardson.
1609. J. Morris.
1610. T. L. Braynard.
1619. J. Haywood, jun., and T. Claridge.
1621. A. Doull.
1636. B. Mitchell.
1637. E. T. Hughes.
1640. J. Leslie.
1643. J. Newman.
1644. R. Pollit.
1649. G. F. Forbes.
1655. R. Wilson.
1656. T. P. Jordeson.
1657. M. A. F. Mennons.
1670. G. Davies.
1678. E T. Hughes.
1685. F. Mordan.
1697. M. Henry.
1701. S. C. Lister.
1723. H. Gloag.
1732. A. Eskell.
1741. S. P. Jackson and A. Jackson.
1744. J. H. Johnson.
1773. W. E. Newton.
1776. H. Green.
1800. M. A. F. Mennons.
1810. T. Fowler and De Grasse Fowler.
1838. G. H. Birkbeck.
1847. W. E. Newton.
1871. W. E. Newton.
1949. H. Cotterell.
2479. E. J. Hanon.
2527. J. P. Budd.
2643. T. Greenwood and J. Dockray.

PATENTS ON WHICH THE STAMP DUTY OF £50 HAS BEEN PAID.

[*From Gazette, January 1st*, 1861.]

December 27th.

3172. J. Boydell.

December 28th.

3182. V. Mourot.
3188. T. Booth.
3193. R. Harmer.
5. A. Parkes and H. Parkes.

December 29th.

3178. T. Spencer.
3184. J. Blake and R. D. Kay.
3185. F. O. Ward.
3191. A. V. Newton.
3194. C. Buhring.
3200. J. Long.

PATENTS ON WHICH THE STAMP DUTY OF £100 HAS BEEN PAID.

[*From Gazette, January 1st*, 1861.]

December 27th.

2996. E. J. Hughes.

December 28th.

3026. H. C. C. De Ruolz and A De Fontenay.